Tuberculous pseudoaneurysm of the femoral artery: A case report

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Pseudoaneurysm of the femoral artery is an extremely rare complication of tuberculosis. We present a case of tuberculous femoral pseudoaneurysm that was successfully treated with resection, direct anastomosis, and postoperative antituberculous chemotherapy. (J Vasc Surg 1999;30:561-4.)

Tuberculous femoral pseudoaneurysm is rare and associated with high mortality. Only six surgically treated cases have been reported previously, and four of these patients died from complications of tuberculosis.[1-6] A successful repair of tuberculous femoral pseudoaneurysm is reported.

CASE REPORT

An 88-year-old man who smoked was brought to our emergency department because of a sudden onset of right thigh swelling that lasted for hours. He had been healthy before, with no previous history of major trauma or other medical disease. On physical examination, the patient was afebrile and hemodynamically stable. Locally, an 8- by 10-cm non-tender, pulsatile mass was detected in the medial aspect of his right upper thigh. The distal pulses presented normally. No other palpable pulsating mass was detected. Findings on auscultation of the lung were normal. There was no leukocytosis, but a mildly elevated erythrocyte sedimentation rate (33 mm/h) was shown by means of laboratory data. A cavity lesion in the left upper lobe was revealed by means of a chest roentgenogram; active pulmonary tuberculosis was inferred. A 4- by 5- by 8-cm heterogenous mass along the right superficial femoral artery (Fig 1) was demonstrated by means of computed tomography of the right thigh, and a ruptured femoral aneurysm was suspected. Magnetic resonance angiography (MRA) was arranged as a means of evaluating the arterial tree because of the patient's age and his risk of contrast-induced renal failure. Medial displacement of the right superficial femoral artery and patent distal runoff were revealed by means of the MRA (Fig 2).

Emergency surgery was performed, revealing a contained ruptured pseudoaneurysm of the proximal portion of the right superficial femoral artery. No lymph nodes were evident near the femoral artery. The arterial wall, proximal and distal to the lesion, was grossly normal. The perforation of the artery communicating with the pseudoaneurysm was 8 mm in diameter, and the hole was partially occluded by a friable clot without any purulent material. The involved segment, which was 2.5 cm in length, was completely resected, and the arterial continuity was restored by means of end-to-end anastomosis after arterial mobilization, with some muscular branches divided. Typical caseous granulomas in the arterial wall and surrounding soft tissue were revealed by means of a histologic examination (Fig 3) with positive acid-fast stain. Atherosclerosis of the vessel was also noted.

The postoperative course was uneventful. The findings of the tuberculin test were positive, but findings from the acid-fast stain and culture of the sputum were both negative. The patient was treated with isoniazid, rifampicin, and ethambutol for 12 months. Eighteen months after the operation, the patient was well and free of recurrent vascular lesion.

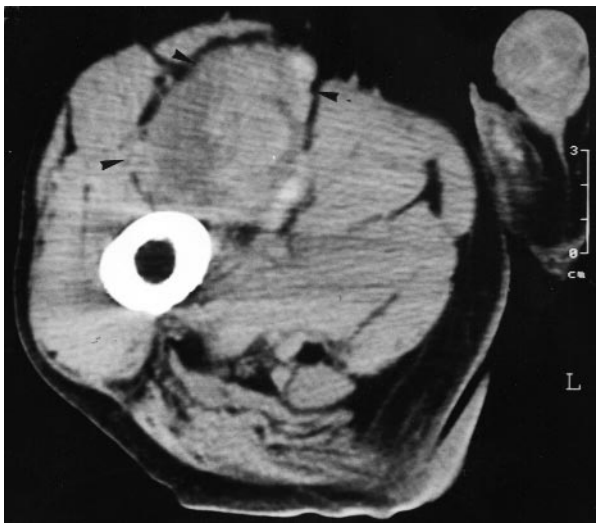

Fig 1. Pseudoaneurysm of right superficial femoral artery on computed tomographic scan. The *arrowheads* indicate the pseudoaneurysm.

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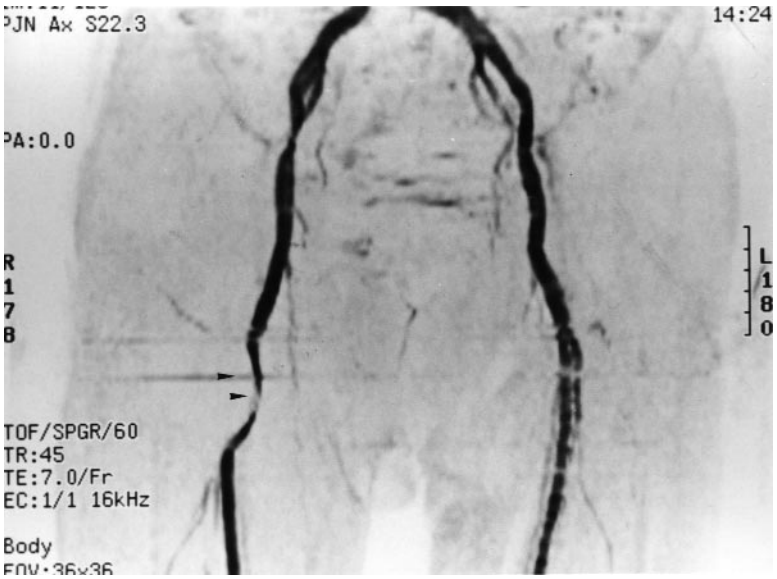

Fig 2. Magnetic resonance angiogram showing medially displacement of right superficial femoral artery (*arrowheads*) and patent distal runoff vessels.

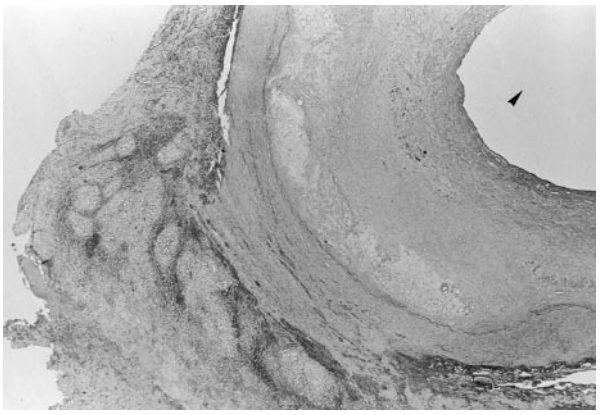

Fig 3. Photomicrograph of the femoral artery wall. The *arrowhead* indicates the lumen. Caseous granulomas are in the wall and soft tissue (original magnification 10×; hematoxylin and eosin).

DISCUSSION

Tuberculous femoral aneurysm is a rare manifestation of extrapulmonary tuberculosis; it may present with or without pulmonary lesions. The first surgically treated case was reported by Brockman in 1926 in a 78-year-old man who was treated by excision and ligation for ruptured femoral aneurysm.[1] To our knowledge, only seven cases (including our own) treated surgically have been reported in the literature (Table I).[1-6] Six men and one woman, ranging in age from 14 to 88 years, with a mean age of 62 years, were examined. Most aneurysms were false (six false and one true). Pulsatile mass, local swelling, fever, and vascular insufficiency are common to all cases. Three cases resulted from lung lesions, and the other three resulted from bursitis of knee, aortitis, and vertebral lesion. In one case, no definite infected source was found.

Two pathways of tuberculosis infection into the vessel wall have been suspected so far.[7] The most common mode of spread to the aorta is direct extension from contiguous lesions, such as lymphadenitis, pericarditis, and empyema. They can also result from hematogenous spread with implantation of the bacilli in an atherosclerotic plaque or in a vas vasorum of the arterial wall. In our patient, no evidence of local lymph node involvement was noted. Thus, seeding of an atherosclerotic area with subsequent intimal disruption or involvement by way of the vas vasorum may have occurred.

For all aneurysms, preoperative angiography is an essential means of delineating the state of not only the aneurysm, but also the distal arterial tree. The MRA is a noninvasive diagnostic modality, more sensitive than contrast arteriography for the detection of distal runoff vessel patency.[8] It also avoids arteriographic complications associated with contrast or arterial puncture.

As with other infected aneurysms, treatment should generally consist of resection of the aneurysm, restoration of vessel continuity, and antimicrobial

Table I. Surgically treated patients with tuberculous femoral aneurysm

Case	*Year/ reporter*	*Patient age (years)*	*Patient sex*	*Type of aneurysm*	*Other infected organ*	*Treatment*	*Result*	*Cause of death*
1	1926/Brockman	14	M	False	Vertebrae	Excision and ligation	A: 8 months	
2	1993/Baumgarten	53	M	False	None	Limb amputation	A: 3 years	
3	1957/Smith	78	M	False	Bursa	Aneurysmorrhaphy	D: 6 months	Myocardial infarction
4	1962/Jepson	78	F	True	Lung (miliary)	Ligation	D: 1 month	Miliary TB
5	1962/Volini	59	M	False	Aorta (TB)	Excision	D: 2 months	Massive hematemesis (aortoduodenal fistula)
6	1980/Mulmed	67	M	False	Lung (miliary)	Excision	D: 27 days	Miliary TB
7	1998/Kao	88	M	False	Lung (TB)	Excision, direct anastomosis	A: 18 months	

A, Alive; *D,* dead; *M,* male; *F,* female; *TB,* tuberculosis.

chemotherapy. A review of previous reports found that treatments included excision and ligation in two cases, ligation only in one, limb amputation in one, and aneurysmorrhaphy in one. In the past, ligation of a healthy segment of artery and excision of all infected tissue was proposed to be a safer treatment of mycotic aneurysm in the extremity. Because ligation may produce a 30% risk of limb ischemia and postligation limb ischemia is not predicted by means of preoperative angiogram, ligation should be used only in emergency situations and in young patients who do not have atherosclerotic disease.[9] The presence of audible Doppler signals at the ankle after proximal arterial ligation and ankle-to-arm indices higher than 0.3 have been used as a reasonable method for selecting patients who require revascularization.[10] Revascularization can be carried out by means of in situ grafting or extra-anatomic bypass grafting for gross infection. The conduit of choice should be autogenous vein in most cases. Our patient was treated with end-to-end anastomosis, because the segment involved was short and there was no gross infection in the operative field. Direct anastomosis may have more physiologic property and avoid other conduit materials.

Three patients died from complications of tuberculosis because there was no effective antituberculous chemotherapy at that time. Most cases of extrapulmonary tuberculosis have a relatively small bacillary load; standard therapy for pulmonary tuberculous should be sufficient as long as there is not a major defect in the host's defense.[11] Drug susceptibility tests should be performed routinely, and the treatment regimen should be revised when there is resistance to any of the drugs being used. Because extrapulmonary tuberculosis is a relatively uncommon disease, there are few controlled studies establishing the efficacy of short-course therapy. We usually use isoniazid, rifampicin, and ethambutol for 9 to 12 months, unless otherwise indicated by sensitivity test, for cardiovascular tuberculosis. Our patient was treated with antituberculous agents for 12 months and was free of recurrence.

Extrapulmonary tuberculosis, such as aneurysm, is expected to increase in incidence throughout the world, because tuberculosis has been reported to be increasing in developing areas and reemerging steadily in advanced countries.[7] All surgeons must be aware of how tuberculosis presents in immunocompromised patients. In conclusion, tuberculous femoral pseudoaneurysm is a fatal complication of tuberculosis, and patients, once the condition is diagnosed, should be treated with resection of aneurysm, restoration of vessel continuity, and antituberculous chemotherapy. Careful clinical follow-up is mandatory because of the risks of anastomotic aneurysm and recurrence aneurysm in another vessel.[12]

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